The minimal semigroup for parabolic equations

Coordinators: Ralph Chill, Jürgen Voigt (TU Dresden)

Let A be a second order elliptic partial differential operator on $\mathbb{R}^d$,

$$Au(x) = \sum_{i,j=1}^{d} a_{ij}(x)\partial_i\partial_j u(x) + \sum_{i=1}^{d} b_i(x)\partial_i u(x),$$

with locally Hölder continuous coefficients and local uniform ellipticity. The objective of the project is to associate a "minimal" semigroup with the parabolic equation $\partial_t u = Au$ and to investigate some of its properties. "Minimal" refers to the construction of the semigroup by approximation "from below" – similarly as in the proof of Theorem 14.1.1 of the ISem. The properties to be discussed will be the existence of a kernel associated with the semigroup, irreducibility and continuity properties of the semigroup, and properties of the generator.

The primary source for the project will be Sections 4 and 5 of [1].

References

[1] G. Metafune, D. Pallara and M. Wacker: *Feller Semigroups on* $\mathbb{R}^N$. Semigroup Forum **65**, 159–205 (2002).

E-mail: ralph.chill@tu-dresden.de, juergen.voigt@tu-dresden.de